

FY06 YEAR IN REVIEW



ACCOMPLISHMENTS OF
THE NAVY'S 6.4 ENVIRONMENTAL
POLLUTION ABATEMENT ASHORE PROGRAM

FALL 2006

CONTENTS

EXECUTIVE SUMMARY	1
Accomplishments	1
FY07 Project New Starts	2
The Road Ahead	2
INTRODUCTION	3
Primary Program Objectives	4
Priority Investment Areas	5
ACCOMPLISHMENTS	6
Made Decisions and Investments Based on Fleet Requirements.	6
Focused the Program on Technology Integration.	6
<i>Technologies Working Their Way Into the Fleet</i>	6
Aligned the Program With the Navy's Strategic Priorities.	10
Established a Collaborative Management Approach.	10
<i>FY07 Project New Starts</i>	10
Conducted Interim Program Reviews To Ensure Ongoing Successful Project Execution.	12
Established Standard Program Procedures & Schedule.	13
Involved the Fleet Through an Expanded Needs Collection Process.	13
<i>High Priority Fleet Needs</i>	14
Leveraged Resources & Expertise of Other Technology Demonstration Programs.	15
Established A Web Site That Promotes Information Exchange.	15
METRICS	16
FINANCIAL REVIEW	17
Overall Program Budget	17
Budget Breakdown by System Command	17
Budget Breakdown by EEC	17
THE ROAD AHEAD: PLANS FOR FY07 & BEYOND	18

EXECUTIVE SUMMARY

Milestones achieved in the Navy's Pollution Abatement Ashore (PAA) program in Fiscal Year (FY) 2006 include successful collaborations across the Navy to help manage the program, expanded and improved needs collection and proposal development and review processes, as well as a recommitment to technology integration.

FY06 also marked a renewed commitment on the part of the program to monitor project performance and validate the success of the program using measurable performance criteria, clearly-defined management priorities, and web-based tools geared to support successful program execution.

Accomplishments

In particular, program personnel achieved the following specific milestones in FY06:

1. Made decisions and investments based on Fleet requirements.
2. Focused the program on technology integration.
3. Aligned the program with the Navy's strategic priorities.
4. Established a collaborative management approach across System Commands (including NAVAIR, NAVFAC, NAVSEA, and SPAWAR).
5. Conducted interim program reviews to ensure ongoing successful project execution.
6. Established standard program procedures and schedule.
7. Involved the Fleet through an expanded needs collection process.
8. Leveraged resources and expertise of other technology demonstration programs (ESTCP, SERDP and JG-PP).
9. Established a web site that promotes information exchange between program personnel and Fleet customers.

FY07 Project New Starts

PAA program management personnel selected the following twelve projects for funding in FY07 and beyond:

1. Biodiesel Usage in Navy Tactical Vehicles
2. Environmental Effects of Abandoned Equipment in Ocean Ranges
3. Evaluation of Energetic Emissions for Open Burn/Open Detonation

**MILESTONES ACHIEVED
IN THE NAVY'S
PAA PROGRAM IN FY06
INCLUDE SUCCESSFUL
COLLABORATIONS
ACROSS THE NAVY AND
A RECOMMITMENT
TO TECHNOLOGY
INTEGRATION.**

**IN FY07,
THE PAA PROGRAM
WILL EXPAND ITS
OUTREACH TO THE
NAVY'S RANGE
COMMUNITY.**

4. Prioritizing Remediation Areas at Aquatic Unexploded Ordnance (UXO) Sites
5. Plastic Waste Processor (PWP) Disc Recycling*
6. Treatment of Synthetic Oil from Ship Bilges*
7. Pierside Ship Void Dewatering & Repair*
8. Citric Acid Passivation
9. Aircraft Field Repair Using Cold Galvanized Coating Systems for High Strength Steels (HSS)
10. Pier Side Ship Masker Emitter Belt (MEB) Cleaning System
11. Dredge Spoil Management Alternatives*
12. Comprehensive Environmental Compliance Approach for Cathodic Protection in Caissons and Floating Drydocks

** Project will result in Initiation Decision Report (IDR).*

The Road Ahead

In FY07, the PAA program will expand capability in the following areas:

- Outreach to the Navy's range community,
- Increased involvement of Fleet personnel to identify needs,
- Expanded involvement of users in project execution, and
- Maximized integration of program-sponsored projects.

INTRODUCTION

The execution of the Navy's PAA program in FY06 was defined by the following actions and events:

- A commitment to the effective transition of technologies to the Fleet,
- A collaborative engagement with System Commands across the Navy,
- A standardization of business practices and enhanced program web site, and
- Continued integration of PAA program-funded products into Fleet operations.

The PAA program is the Navy's environmental 6.4 research and development demonstration and validation (dem/val) program, sponsored by the Chief of Naval Operations Environmental Readiness Division (N45) and managed by the Naval Facilities Engineering Command (NAVFAC). The program supports Fleet readiness by minimizing operational risk, constraints, and costs while ensuring shore-based environmental stewardship and regulatory compliance. The program seeks to accomplish this mission through the evaluation of cost-effective technologies, processes, materials, and knowledge enhance environmental readiness of Naval shore activities and ensure they can be integrated into weapons system acquisition programs.

**THE EXECUTION OF
THE NAVY'S PAA
PROGRAM IN FY06
WAS DEFINED BY A
COMMITMENT TO
THE EFFECTIVE
TRANSITION OF
TECHNOLOGY
TO THE FLEET.**

The guided missile cruiser USS COWPENS.
U.S. Navy photo by Mass Communication
Specialist Seaman Patrick L. Heil



Primary Program Objectives

The PAA program is focused on three primary objectives:

1. **Collect, Validate & Rank Environmental Research, Development, Test & Evaluation (RDT&E) Needs.** The PAA program expands awareness of opportunities within the Navy shoreside community to encourage and facilitate the submittal of well-defined environmental needs and requirements.
2. **Resolve High Priority Needs.** The PAA program seeks to ensure that program investments and the resulting RDT&E projects maintain a direct and consistent link to the defined needs.
3. **Integrate Solutions & Validate Benefits.** The PAA program also works to maximize the number of program-derived solutions that are successfully integrated into the Fleet and future weapons system acquisitions and verify that the solutions provide the anticipated benefits.

Distance support logistics experts and other Sailors of U.S. Fleet and Industrial Supply Center (FISC) Yokosuka, Japan, form a human chain to safely load and off-load supplies from the USS COWPENS (DG 63). The PAA program seeks to develop innovative techniques to manage ship hazardous material/waste offload to shore facilities.
Photo by Yohsuke Onda, FISC Yokosuka



The guided missile cruiser USS COWPENS.
U.S. Navy photo by Mass Communication Specialist Seaman Joshua Wayne LeGrand



Priority Investment Areas

The PAA program makes its primary investments in the following areas and Environmental Enabling Capabilities (EEC):

1. **Range Sustainment.** In the area of range sustainment (EEC-2), the PAA program invests in innovations that address environmental impacts and restrictions at Navy ranges to ensure that Naval training ranges and munitions testing/manufacturing ranges are fully available and efficiently utilized. Example projects include range residue management and underwater UXO risk assessment.
2. **Ship-to-shore Interface.** In the ship-to-shore interface (EEC-4) arena, the PAA program seeks to develop innovative techniques to manage ship hazardous material/waste offload to shore facilities. Example projects include vertical launch tube water treatment and shipboard pipe flushing acid waste treatment.
3. **Weapon System Sustainment.** The focus of this thrust area (EEC-3) is on the organizational- and intermediate-level Fleet maintainer with the overall objectives of reducing the cost of compliance and increasing Fleet readiness. Example projects include F-404 engine (F-18 Hornet) drive shaft cleaning using plastic media blasting and Freon-alternative fuel cell leak detection methods.
4. **Air and Port Operations.** In this area (EEC-4), the PAA program sponsors projects pertaining to air and port operations that ensure Fleet readiness. Example projects include bird radar imaging for flight operations and an in-port ballast water treatment system.
5. **Regulatory and Base Operations.** In this area (EEC-5), the PAA program provides cost-effective methods for identifying, analyzing, and managing environmental constraints related to current and projected regulatory impacts. Example projects include a joint service solvent substitution methodology, improved Best Management Practices (BMP) for stormwater runoff, and optimization of oil-change intervals for non-tactical vehicles.

The USS JOHN F. KENNEDY (CV 67) arrives in port after completing an intermediate level exercise designed to forge the strike group into a cohesive fighting team — a critical step in pre-deployment training. During this particular exercise, more than a dozen ships conducted war game exercises using U.S. training ranges. These ranges offer training facilities and realistic simulations, better preparing U.S. Navy ships and Sailors for conflicts across the globe. The PAA program invests in innovations that address environmental impacts and restrictions at Navy ranges to ensure that Naval training ranges and munitions testing/manufacturing ranges are fully available and efficiently utilized.

U.S. Navy photo by Patrick Nichols

**THE PAA PROGRAM
INVESTS IN INNOVATIONS
THAT ADDRESS
ENVIRONMENTAL IMPACTS
AND RESTRICTIONS
AT NAVY RANGES.**

ACCOMPLISHMENTS

Milestones achieved in the PAA program in FY06 include successful collaborations across the Navy to help manage the program, expanded and improved needs collection and proposal development and review processes, as well as a recommitment to technology integration.

Made Decisions and Investments Based on Fleet Requirements.

In FY06, the PAA program based its management decisions and investments on documented Fleet operational requirements.

Through the involvement of various Navy environmental Functional Working Groups (FWG), the PAA program enhanced the Navy's capability to better understand and document the environmental risks associated with Fleet operations. In FY06, a total of nine Navy FWGs were involved in identifying, collecting, and ranking Fleet operational needs. FWGs are comprised of Fleet personnel or their representatives that address issues related to a specific area of Fleet operations. The following FWG support is instrumental to the continued success of the PAA program:

- Range Sustainment
 - The Range Commanders Council
 - The Range Support Group
 - The Underwater Range Sustainment Group
- Weapons System Sustainment
 - The Navy Aviation Technology Integration Program
 - The Naval Sea System Command's (NAVSEA) Pollution Prevention (P2) Working Group
- Air and Port Operations
 - NAVFAC's Clean Air Act (CAA), Clean Water Act (CWA), and Total Maximum Daily Load (TMDL) Working Groups, the Risk Assessment Working Group (RAW), and the Alternative Restoration Technology Team (ARTT).
- Base and Regulatory Compliance
 - NAVFAC's CAA, CWA, and Safe Drinking Water Act (SDWA) Working Groups, the Petroleum, Oil and Other Hazardous Substances Working Group, the RAW and the ARTT.

Focused the Program on Technology Integration.

In FY06, the PAA program concentrated its efforts on the successful integration of program-sponsored technology solutions into Fleet operations.

Technologies Working Their Way Into the Fleet

In FY06, the PAA program was particularly successful in executing the twelve projects described on the following pages.

**IN FY06, THE
PAA PROGRAM
BASED ITS
MANAGEMENT
DECISIONS AND
INVESTMENTS ON
DOCUMENTED FLEET
OPERATIONAL
REQUIREMENTS.**

NO.	TECHNOLOGY	DESCRIPTION	BENEFITS	INTEGRATION ACCOMPLISHMENTS
1.	Zinc Removal from Compwater	This project is identifying, evaluating, selecting and demonstrating the BMPs for mitigating dry dock discharges regulated by the National Pollutant Discharge Elimination System (NPDES).	<ul style="list-style-type: none"> On-site system will allow launch-missiles reloading worldwide. Eliminates disposal of hazardous wastewater laden with propellant contaminants including cyanide. Reduces disposal cost – one event costs \$500K to dispose of 16,000 gallons. Return on Investment (ROI)/ Cost Avoidance = 11.7 	<ul style="list-style-type: none"> Provide recommendation report for dry dock BMP for NAVSEA dry dock working groups. Generate IDR for working groups within the dry dock communities at Navy shipyards. Provide technical support to users.
2.	F-404 Drive Shaft Cleaning	This project is using Type V Plastic Media Blasting (PMB) to remove coking from F-404 drive shaft, air duct and damper to replace soaking in solvent and scraping.	<ul style="list-style-type: none"> Eliminates MIL-C-85704 Hazardous Air Pollutant (HAP) chemical cleaner use. Reduces maintenance hours required (from 1.5 hours to less than 0.5). Reduces turn-around time from 24 hours to less than 0.5 hours. ROI = 12.7 	<ul style="list-style-type: none"> Dem/Val completed at Naval Air Depot (NADEP) Jacksonville and Aircraft Intermediate Maintenance Department (AIMD) Oceana. Full integration is expected in FY07. Endorsed by the Original Equipment Manufacturer (OEM) and user community. Authorized by Fleet Support Team (FST). Revised technical manual. Seeking approval to use existing PMB process.
3.	Corrosion-Inhibited Mildew Remover	The conventional means of removing mildew from aircraft floorboards and confined areas entails the use of alcohol and solvents that are ineffective and expose sailors and marines to harmful materials and generates hazardous waste. The new mildew removal material is environmentally benign, effective and inhibits new mildew growth and corrosion.	<ul style="list-style-type: none"> Reduces man-hours and costs required to remove/clean mildew from aircraft systems. Eliminates the use of current corrosive cleaners and passes corrosion testing IAW MIL-PRF-85570D. Avoids health risks and symptoms associated with mildew exposure. Enhances Fleet readiness and provides a safer and healthier environment for the sailor. 	<ul style="list-style-type: none"> The Naval Air Systems Command (NAVAIR) authorized the use of new corrosion inhibited mildew remover for aircraft applications. AMCOM authorization received. Licensing the mildew remover (to Armick, Inc.) for product manufacture. Patent application pending (Navy case 97040).
4.	AVDEC™ Conductive Gaskets	AvDEC Hi-Tak® gaskets provide superior corrosion protection over current edge seal methods by guaranteeing complete mating area conductivity and seal.	<ul style="list-style-type: none"> Long-term corrosion protection provided by gaskets reduces communication/navigation system failures and reduces maintenance rework. Simple installation and removal, easier troubleshooting. Reduce maintenance hours required by 60 to 70 percent (approximately 91 labor hours per aircraft). ROI/Cost Avoidance = 13 Payback = 2 years 	<ul style="list-style-type: none"> Dem/Val and/or deployment on the following platforms: EA-6B, H-60, F/A-18C/D, T-45, H-1, E-6, P-3, and C-130. Obtained user endorsement. OEMs are investigating associated benefits. Materials and processes added to NA16-1-540 and NAO1-1A-509 maintenance manuals. The Office of the Secretary of Defense and the Defense Logistics Agency have provided transition funding (for gasket kits, manual changes, etc.).

NO.	TECHNOLOGY	DESCRIPTION	BENEFITS	INTEGRATION ACCOMPLISHMENTS
5.	Prohibited and Controlled Chemical List (PCCL)	The purpose of this project is to develop a standard PCCL, to guide and prioritize hazardous substance reduction afloat, ashore and in ship acquisition programs.	<ul style="list-style-type: none"> • Will result in standardized guidance for hazardous substance avoidance, across the Navy, based on environmental regulatory impact and human health factors. • Reduced liability and hazardous material lifecycle costs. 	<ul style="list-style-type: none"> • The PCCL is included in the Naval Vessel Rules for Environmental Protection Systems and NAVSEA Design Guidance. • Collaboration exists among: <ul style="list-style-type: none"> • Department of the Navy Environmental Safety and Occupational Health Acquisition Working Group, • Joint Service Solvent Substitution Working Group, and • Department of Defense's Materials of Emerging Regulatory Interest Team.
6.	Underwater UXO Environmental Effects	The purpose of this project is to identify the technical information needed by Navy range managers to support sound, scientifically defensible decisions at operational ranges and underwater MRP sites.	<ul style="list-style-type: none"> • Provide scientifically defensible information and data to range managers to make decisions to ensure that underwater ranges remain operational. • Corrosion model allows policy makers and range planners to forecast when the marine environment will be exposed to munitions constituents. 	<ul style="list-style-type: none"> • Three peer-reviewed journal articles. • Dem/Val of mobility model. • Integrating scientific data into Adaptable Risk Assessment Modeling System.
7.	Compwater Fuel Ballast Water Treatment	The purpose of this project is to identify, evaluate, select and demonstrate Navy-wide BMPs for the in-port collection and treatment of compensated fuel ballast water.	<ul style="list-style-type: none"> • Treatment cost is \$0.02 per gallon. • Reductions in transfer of oily wastes ashore. • Increased capability to refuel in port. 	<ul style="list-style-type: none"> • Technology integration promoted in Currents magazine and on the Naval Facilities Engineering Service Center (NFESC) web-site. • User Data Package generated for a cost effective collection and treatment system for compwater.
8.	Acid Waste Treatment Technology	The objective of this project is to integrate a pier side system for the recycling, reuse and management of acid and heavy metal wastewater generated from shipboard seawater heat exchanger pipe flushing operations.	<ul style="list-style-type: none"> • 90 percent reduction of water and chemical costs. • \$200,000 savings/year at each shipyard from the disposal of shipboard pipe flushing hazardous waste. • Reduced liability for chemical spills. • ROI/Cost Avoidance = 31 (10 units over a 10 year life) 	<ul style="list-style-type: none"> • Dem/Val occurred at Naval Undersea Warfare Center (NUWC) Keyport, the Industrial Wastewater Treatment Plant (IWTP) at North Island, and the Intermediate Maintenance Facility (IMF) at Pearl Harbor Naval Shipyard (PHNSY). • Integration sites: the IMF at Portsmouth Naval Shipyard (PNSY), the Norfolk Naval Shipyard (NNSY), PNSY, and Naval Stations Mayport, San Diego, Guam, Yokosuka, Rota, and Sigonella. • Users are members of the Advanced Wastewater Treatment Technologies Working Group. • Developed a NAVSEA Integration Plan.

NO.	TECHNOLOGY	DESCRIPTION	BENEFITS	INTEGRATION ACCOMPLISHMENTS
9.	Portable Aircraft Maintenance Facility	Integrate a system to allow for environmentally friendly stripping and painting rotary wing aircraft at Intermediate Maintenance Program deployed sites.	<ul style="list-style-type: none"> • System safely confines dust generated by PMB blasting operations. • Aircraft remains with squadron during maintenance intervals. • Allows for the safe performance of corrosion control processes. • Enhanced Fleet readiness - reduced aircraft turnaround time by 30 to 60 days. • ROI/Cost Avoidance = 3.0 	<ul style="list-style-type: none"> • Authorized by the Program Manager - Air/Fleet Support Team/Class Desk/Base. • Successfully installed at Marine Corps Base (MCB) Hawaii, Kaneohe Bay. • Implementation underway at: <ul style="list-style-type: none"> • Naval Air Station (NAS) Norfolk, • Marine Corps Air Station (MCAS) Futenma, and • HC25 (Andersen Air Force Base).
10.	Joint Service Solvent Substitution	Develop a framework to systematically identify and qualify compliant alternative cleaners for solvents containing Volatile Organic Compounds and HAPs in Department of Defense (DoD) maintenance operations.	<ul style="list-style-type: none"> • Eliminate the emission control equipment requirement. • Eliminate HAP containing solvents that require record keeping. • Eliminate chemicals that require Toxic Release Inventory (TRI) reporting. • ROI/Cost Avoidance = 191 (for PD-680 (Army sample)). 	<ul style="list-style-type: none"> • Established Joint Service Solvent Substitution (JS3) framework. • Established JS3 working group and database. • Developed JS3 methodology for authorization and implementing solvent substitutes. • Multiple ongoing DoD sponsored dem/val efforts for evaluating alternative cleaners.
11.	Improved BMPs for Storm Water Runoff	The purpose of this project is to develop BMPs for enhanced management of storm water runoff to reduce cost and address Navy unique requirements.	<ul style="list-style-type: none"> • Helps to achieve compliance with NPDES regulations. • Treatment costs less than the cost of collecting and metering runoff into sanitary sewer and 1/3 less than commercial-off-the-shelf technology. • Below grade structure preserves space. • ROI/Cost Avoidance = 2.4 	<ul style="list-style-type: none"> • Developed BMP web site. • Successfully demonstrated system at Navy Regional Recycling Center in San Diego. • Ongoing demonstration of system at Anniston Army Depot. • Partnered with Aberdeen Test Center to provide technology integration materials. • Technology integration to be accomplished through an Environmental Security Technology Certification Program (ESTCP) project.
12.	Noise Attenuation Device (NAD)	This project developed a low cost approach for reducing the noise from the DoD's high performance jet engines during stationary testing.	<ul style="list-style-type: none"> • Noise reductions of more than 15 decibels demonstrated with full-scale engines. 	<ul style="list-style-type: none"> • Full-scale test conducted at NAS Patuxent River on F-404 engine with afterburner. • ESTCP proposal for larger engines (e.g., the Joint Strike Fighter F-135 engine) has been submitted. • Potential implementation sites are where DoD high-performance engines are deployed and maintained.

Aligned the Program With the Navy's Strategic Priorities.

The Secretary of Defense has directed the military services to develop transformational strategies that will greatly expand U.S. options available to Command Authority across the full spectrum of warfare. The Naval Operational Concept (NOC), "Naval Power 21" (NP21) provides the transformational vision for the Navy and Marine Corps. Sea Power 21 is the Navy's transformational document, and is based on four Naval Capability Pillars (NCP): SEA SHIELD, SEA STRIKE, SEA BASING and FORCEnet and the supporting initiatives of SEA WARRIOR, SEA TRIAL and SEA ENTERPRISE.

**THE PAA PROGRAM
ENSURES THAT ITS
PRIORITIES STAY IN
ALIGNMENT WITH THE
NAVY'S STRATEGIC
OBJECTIVES BY LINKING
FLEET NEEDS TO
OPERATIONAL
REQUIREMENTS.**

Five Navy environmental RDT&E EECs are required to meet the objectives of Sea Power 21. The PAA program makes investments in four of the five EEC areas.

By linking the needs collected from the Fleet community to operational requirements, the PAA program ensures that the program's priorities stay in alignment with the Navy's strategic objectives.

Established a Collaborative Management Approach.

Through its Technology Development Working Group (TDWG), the PAA program brought the requisite expertise to the table from each Navy System Command (SYSCOM) to ensure balanced participation and a direct connection to the Fleet through each SYSCOM representative. The TDWG has representatives from Navy SYSCOMs including NAVAIR, NAVSEA, NAVFAC, and the Space and Naval Warfare Systems Command (SPAWAR). The success of this approach, supported and embraced by each SYSCOM, is demonstrated by the following accomplishments:

- The TDWG collected and reviewed 118 responses to the program's FY06 needs solicitation and developed a list of 18 highly ranked needs.
- The TDWG reviewed 23 pre-proposals and 12 proposals for funding consideration. These reviews ensured that proposed projects would successfully achieve technology integration.
- The TDWG selected 12 FY07 project new starts that best met the collective needs of the program. (See table below.)

FY07 PROJECT NEW STARTS

INVESTMENT AREA	NO.	PROJECT	DESCRIPTION
Base and Regulatory Compliance (EEC-5)	1.	Biodiesel Usage in Navy Tactical Vehicles	The objective of this project is to identify the operational and technical challenges to authorize the CONUS use of biodiesel in Navy tactical vehicles during training exercises. The intent is to leverage Navy funding with DoD (ESTCP) funds to ensure all the Services will benefit from this demonstration project.
Range Sustainment (EEC-2)	2.	Environmental Effects of Abandoned Equipment in Ocean Ranges	This project will develop a data repository of non-retrievable or expendable equipment (non-munitions) that are used in at-sea RDT&E events and at-sea training exercises on ocean ranges to include their constituents, potential chemicals of concern, and associated environmental effects.

INVESTMENT AREA	NO.	PROJECT	DESCRIPTION
	3.	Evaluation of Energetic Emissions for Open Burn/Open Detonation	This project seeks to determine the species contained in the plume from the open detonation of metal encased propellants and explosives including metal emissions, non-metal emissions, and residues (e.g., resins, composites).
	4.	Prioritizing Remediation Areas at Aquatic UXO Sites	The objective of this study is to demonstrate that advanced data mining techniques applied to existing aquatic geophysical survey data can significantly improve the speed, accuracy and repeatability of UXO target identification.
Ship to Shore Interface (EEC-4)	5.	Plastic Waste Processor (PWP) Disc Recycling*	This project will develop alternatives that will eliminate the landfill disposal of PWP discs without negatively impacting the operational readiness of Navy ships or incurring additional costs.
Weapon System Sustainment (EEC-3)	6.	Treatment of Synthetic Oil from Ship Bilges*	The objective of the effort is to determine if synthetic lubricating oils in bilge and other oily wastewaters will adversely affect current treatment systems and if so, what system modifications would need to be demonstrated and incorporated.
	7.	Pierside Ship Void Dewatering & Repair*	The purpose of this project is to demonstrate an integrated transportable void dewatering and wastewater treatment system that will enable discharge to the sewer or surrounding water and eliminate the need to transport and dispose of the removed liquid.
Weapon System Sustainment (Cont.)	8.	Citric Acid Passivation	This test is necessary to qualify candidate formulations for use in environments with significant exposures to salt mist. Test data will be used to identify the most promising formulations and make implementation recommendations to Navy depots, acquisition programs, and OEMs.
	9.	Aircraft Field Repair Using Cold Galvanized Coating Systems for High Strength Steels (HSS)	The objective of this project is to demonstrate the extent to which this repair technology can be successfully utilized at the operational level to mitigate the corrosion of HSS components
	10.	Pier Side Ship Masker Emitter Belt (MEB) Cleaning System	This project will determine if an integrated acid flushing cleaning process with a pier side treatment/recycling system can effectively clean MEBs, mitigate the discharge of constituents into surrounding water, increase overall process efficiency and cost effectiveness, reduce impact to shore facilities for by-product disposal acid waste, and reduce diver exposure to high levels of in-water noise that limits the duration of their work.
Air and Port Operations (EEC-4)	11.	Dredge Spoil Management Alternatives*	The objective of this project is to determine the potential beneficial reuse of the dredged material from identified Navy sites and evaluate the viability of using contaminated dredge spoils as a cement kiln feed stock.
	12.	Comprehensive Environmental Compliance Approach for Cathodic Protection in Caissons and Floating Drydocks	Elevated concentrations of zinc in ballast water from caissons and floating drydocks (believed to be from sacrificial anodes and coatings used for corrosion protection) frequently exceed water quality criteria. A guidance document will be developed to assist Naval facilities in the selection and installation of environmentally friendly and effective corrosion protection systems.

* Project will result in Initiation Decision Report (IDR).

Conducted Interim Program Reviews To Ensure Ongoing Successful Project Execution.

During FY06, the PAA program conducted three interim program reviews to ensure that funded projects remained focused on the Fleet-driven need and would successfully result in a technology of value to the Fleet. In a number of instances, project managers directly involve the user community in the execution of their projects, including:

- **Acid Waste Treatment Technology.** The objective of this project is to integrate a pier side system for the recycling, reuse and management of acid and heavy metal wastewater generated from shipboard seawater heat exchanger pipe flushing operations. In FY06, users were involved in the dem/val of this technology at three installations including NUWC Keyport, IWTP North Island, and the IMF at PHNSY. With the help of enthusiastic users, this technology was successfully integrated into the operations of the following sites: the IMF at PHNSY, NNSY, PNSY, as well as Naval Stations Mayport, San Diego, Guam, Yokosuka, Rota, and Sigonella.
- **F-404 Drive Shaft Cleaning.** This project is using Type V PMB to more efficiently and effectively remove coking from F-404 drive shafts, air ducts and dampers. (Currently, the Fleet uses a variety of measures to clean the drive shaft that includes soaking the shaft in solvent (that happens to be a Hazardous Air Pollutant) over several days and repeatedly scraping the coking deposits away – a task that is labor intensive and difficult to accomplish.) In FY 06, successful demonstrations were held at NADEP Jacksonville and the AIMD Oceana. In addition, this new technology was endorsed by the OEM and authorized by the FST. The appropriate maintenance manuals were also revised. Full integration is expected in FY07.

Aviation Machinist Mate Airman Paul Ward inspects the afterburner section of an F404 engine used in F/A-18C Hornets. Unfortunately, the fan drive shafts of these engines have a tendency to “coke” (build up petroleum deposits) because of repeated heating and cooling. Currently, the Fleet uses a variety of measures to clean the drive shaft that includes soaking the shaft in solvent (that happens to be a Hazardous Air Pollutant) over several days and repeatedly scraping the coking deposits away – a task that is labor intensive and difficult to accomplish. The PAA program sponsored a demonstration and validation project to more effectively and efficiently remove coking deposits from the F404 engine drive shaft using plastic media blasting.

U.S. Navy photo by Photographer's Mate Airman Jordon Beesley



- **Pollutant Source Tracking.** The objective of this project is to provide Navy regional and base environmental managers with alternative techniques for evaluating TMDL limits. This allows environmental managers to differentiate between Navy and non-Navy operational impacts on their surrounding water bodies. The Navy can negotiate with State and local regulators when setting TMDL limits for Navy installations (based on Navy-only impacts) that would otherwise be based on combined community impacts. Discussions held between the CWA/SDWA Media Field Team (MFT) were instrumental in determining the technical approach needed by base personnel and regulators. Their direct involvement in developing the project plan helped control project costs and ensured that the project schedule reflected user needs.

Established Standard Program Procedures & Schedule.

In FY06, the PAA program defined, disseminated, and institutionalized the procedures and annual milestones necessary to ensure the consistent execution of the program in this fiscal year and beyond. This systematic approach helps to institutionalize program procedures and schedule, gives program participants the chance to plan, and results in better quality needs from the Fleet, stronger proposals from the Principal Investigators, and better executed projects. In particular, the following constructs were developed:

- **A Standard Operating Procedure (SOP).** This SOP describes the PAA program's essential business processes from the collection, development and ranking of Navy ashore RDT&E requirements to the successful integration of environmental solutions into the hands of the Fleet. This SOP also defines the program's priorities and provides guidelines for navigating the proposal process to take full advantage of program investment opportunities. This SOP is used to govern the development, validation, and implementation of all products and technologies resulting from the program.
- **Priority Investment Areas.** The program also promulgated its "priority investment areas" to help the Fleet, project managers, and others to appreciate the program's priorities for FY06 and beyond. Those investment areas, in priority order, are range sustainment, ship-to-shore interface, weapon system sustainment, air and port operations, and regulatory and base operations.
- **Annual Execution Schedule.** Each year, the PAA program establishes and maintains a schedule to manage the collections of needs, evaluate proposals submitted to address those needs, initiate new projects, and review the ongoing performance of existing projects.

Involved the Fleet Through an Expanded Needs Collection Process.

One way in which the PAA program engages the Fleet operational community is through the program's needs identification process. In FY06 (and every year), the PAA program executed a formal process for collecting outstanding environmental needs from the Fleet. The program's TDWG, MFTs, and Subject Matter Experts helped to identify requirements/needs from the Fleet and then rank and select projects that best address those needs.

**IN FY06, THE
PAA PROGRAM
INSTITUTIONALIZED
THE PROCEDURES
NECESSARY TO
ENSURE THE
CONSISTENT
EXECUTION OF
THE PROGRAM.**

In FY06, the PAA program received a tremendous response from its needs solicitation. Once received, the needs were validated and consolidated (where appropriate), and then ranked. The needs that best reflected the program's investment priorities were the mostly highly ranked. A total of 118 responses were received to the program's needs solicitation in FY06. Eighteen highly-ranked Fleet operational needs (with environmental solutions) resulted from the program's validation, consolidation and ranking process.

Needs that were not highly ranked by the PAA program in FY06 will be retained (for historical purposes) and re-evaluated on an annual basis.

High Priority Fleet Needs

The PAA program's needs collection and ranking process in FY06 resulted in the following 18 highly-ranked needs:

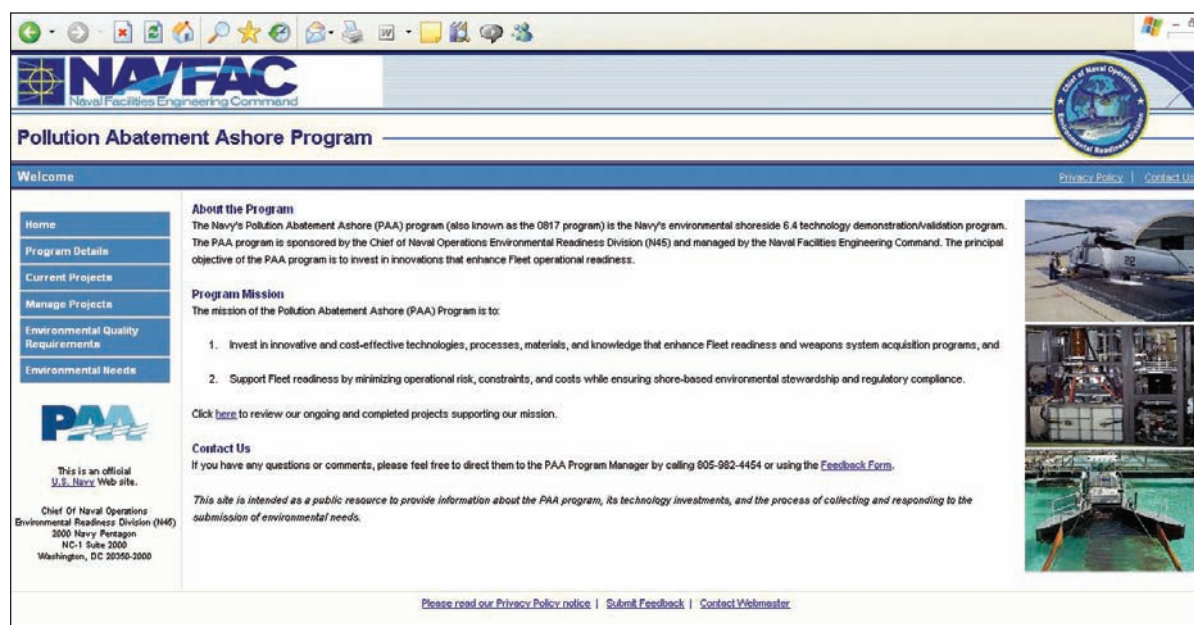
AREA	NO.	NEED
Range Sustainment (EEC-2)	1.	Evaluation of Energetic Emission for Open Burn/Open Detonation Permitting
	2.	Underwater Blow-in-Place Detonation Mitigation Techniques Evaluation
	3.	Environmental Effects of Abandoned Equipment in Navy Ocean Ranges
Weapon System Sustainment (EEC-3)	4.	Environmentally-Compliant Coatings Removal
	5.	Control Emissions from Tactical Vehicle Engines
	6.	Reduce TRI Emissions and Hazardous Waste Disposal Resulting from the Application and Removal of High Temperature Metallic Coatings on Aircraft Engines
	7.	Demonstrate a Product That Will Easily Remove Powdercoating
	8.	A Method to Non-destructively Inspect Heat Damaged Advanced Composite Laminate Structures
Ship-to-Shore Interface (EEC-4)	9.	Plastic Waste Shoreside Disposal and Recycling
	10.	Shoreside Management of Ship Graywater
	11.	Efficient, Effective and Environmentally Compliant Shoreside-Ship Flushing and Maintenance Operations
	12.	Pier-side Management of Uniform National Discharge Standard Discharges
	13.	Shipboard Sludge Minimization, Reduction, and Treatment
Air and Port Operations (EEC-4)	14.	Alternatives for Anodic Protection of Caissons and Floating Drydocks
	15.	Sensors/Detection for Surface Water Oil Spills
	16.	Dredge Spoil Management Alternatives
	17.	Better Tools for Fuel Spill Assessment
Regulatory and Base Operations (EEC-5)	18.	Issues with Drinking Water Distribution Systems

Leveraged Resources & Expertise of Other Technology Demonstration Programs.

In FY06, the PAA program continued to build on successful partnerships with other environmental 6.4 programs to leverage resources and expertise. The dem/val projects having joint service application initiated by the PAA Program are forwarded to the Strategic Environmental Research and Development Program (SERDP), the Environmental Security Technology Certification Program (ESTCP), and the Joint Group on Pollution Prevention (JG-PP). This ensures that each Service has identified the technical criteria of the solution and will be evaluated during the project. The result is to eliminate duplication of effort and maximize the integration of technologies across the Services.

Collaborations with these other programs help to support the ongoing success of a number of the PAA program's own projects. For example, the eBirdRad program, a PAA program-sponsored project, utilized ESTCP funds to expand the application of this technology across DoD. In addition, the ESTCP has expanded the PAA program's investigation of the feasible use of biodiesel in tactical vehicles to include other vehicles across DoD.

Established A Web Site That Promotes Information Exchange.



In FY06, the PAA program dedicated resources to launch a single, comprehensive web site as the sole repository of all essential program information that provides up-to-date information about the status of the Navy's innovative dem/val program.

The PAA web site supports the collaborative decision making necessary to validate and prioritize the proposed needs, allocate them to Environmental Quality Requirements, and review/rank project proposals. The enhanced PAA web site (at www.paa.navy.mil) is the now the single access point for the submittal of environmental needs, pre-proposals and full proposals. It also has a voting feature that allows Navy stakeholders to rank needs and projects.

METRICS

The PAA program assesses its progress using performance metrics in the following three areas:

1. **Project Execution.** These metrics capture the degree to which the PAA program effectively executes individual projects.
 - a. **Fleet Needs:** The number of needs collected from the Fleet each year. [118 needs from Fleet operational personnel and acquisition community members were collected.]
 - b. **Address High Priority Needs:** The number of needs ranked as “high priority” by program personnel each year. [The program identified 18 high priority Fleet operational needs. The FY07 project new starts address these high priority needs.]
 - c. **Performance-Based Evaluation:** Each project is evaluated based on cost, schedule and performance to determine how efficiently individual projects are executed. Projects are adjusted based on regular evaluations conducted by program personnel. [The PAA program sponsored three interim program reviews to reevaluate project cost, schedule and performance objectives.]
2. **Technology Integration.** This metric deals with the program’s ability to effectively integrate technologies into Navy operations. Project buy-in is obtained from process users, approval authorities and procurement stakeholders prior to project funding. Integration objectives are reviewed and approved by the TDWG at the onset of each project (“go/no-go” decision). No project is funded until objectives are approved. Integration objectives and accomplishments were reviewed semi-annually. Products integrated are re-evaluated after one year to ensure goals are met, address unanticipated barriers and update associated ROI/cost avoidance numbers.
3. **Cost/Environmental/Operational Benefit.** These metrics pertain to the benefit achieved by the Navy through the integration of innovative products and services and fall into three categories:
 - a. Cost avoidance,
 - b. Meet current and future regulatory compliance status, and
 - c. Increased Fleet readiness. In this area, the PAA program is tracking the following indicators:
 - User ROI/cost avoidance (>2.5),
 - Quantify environmental benefits,
 - Reduced emissions and/or waste generated,
 - Reduced environmental liability,
 - Informed decision-making,
 - Reduced worker exposure,
 - Reduced cost of compliance,
 - Reduced Notice of Violations,
 - Quantify operational readiness benefits,
 - Reduced operation & maintenance costs,
 - Reduced maintenance time,
 - Reduced turn around time, and
 - Program management costs (5 percent).

FINANCIAL REVIEW

Overall Program Budget

In FY05, the PAA program budget was returned to its historical funding level after absorbing a significant cut in FY04. The program budget over the FY04 Future Year Development Plan (FYDP) is provided below.

Fiscal Year	Program Budget
FY04	\$3.258
FY05	\$5.988
FY06	\$6.459

in millions

Budget Breakdown by System Command

PAA program funding for FY05 and FY06 by performer is presented in the table below.

Organization	FY05		FY06	
	\$	%	\$	%
NAVAIR	815	13.6	800	12.4
NAVFAC	4,286	71.6	4,619	71.5
NAVSEA	277	4.6	520	8.0
SPAWAR	1,045	17.4	870	13.5
Program Management	380	6.3	450	6.9
Total	5,988		6,459	

in thousands

NAVAIR primarily supports PAA projects under EEC-3 (weapon system sustainment). NAVFAC primarily supports PAA projects under EEC-2, -3, -4, and -5. NAVSEA primarily supports PAA projects under EEC-3 and -4 (weapon system sustainment and ship-to-shore interface). SPAWAR supports PAA projects under EEC-2 and -5 (range sustainment and regulatory and base operations).

Budget Breakdown by EEC

The PAA Program funds by EEC are presented in the table below.

EEC	FY05	FY06	FYDP
EEC-1 (Weapon System Operations)	0	0	0
EEC-2 (Range Sustainment)	1,227	1,465	25%
EEC-3 (Weapon System Sustainment)	1,137	1,709	25%
EEC-4 (Air & Port Operations)	1,530	1,965	40%
EEC-5 (Regulatory & Base Operations)	1,054	1,310	10%

in thousands

**THE PAA PROGRAM
BUDGET IN FY06
TOTALED ALMOST
6.5 MILLION
DOLLARS –
A NEARLY
EIGHT PERCENT
INCREASE OVER THE
PREVIOUS YEAR.**

THE ROAD AHEAD: PLANS FOR FY07 & BEYOND

In FY07, the PAA program will concentrate its resources and personnel in the following areas:

**IN FY07, THE PAA
PROGRAM WILL
PROVIDE EVEN
MORE EMPHASIS ON
SUPPORTING RESEARCH
AND DEVELOPMENT
THAT IS RELEVANT
TO THE ONGOING
SUSTAINMENT
OF THE NAVY'S
TRAINING RANGES.**

- **Increased Emphasis on Range Sustainability.** In FY07, the PAA program will provide even more emphasis on supporting research and development that is relevant to the ongoing sustainment of the Navy's training ranges. This will be achieved by requesting needs, feedback about ongoing projects, and other inputs from representatives of the range community including members of the Range Sustainment Group, the Range Commanders Council, and the Range Environmental Working Group.
- **Better Outreach to the Fleet.** In FY07, the PAA program will redouble its efforts to capture and address the operational needs of the Fleet. One way of accomplishing this objective is to place greater expectations on SYSCOM representatives on the TDWG and others to reach into their individual user communities, up-front and often, to identify better quality user needs, obtain feedback regarding ongoing projects, and get help to ensure the successful integration of technologies. The PAA program will also work to further institutional a standard needs collection process that will embrace the user community.
- **More Involvement from the User Community in Project Execution.** In FY07, the PAA program will continue to include the user community during the execution of individual projects (including biannual project reviews). The program will require user community participation in project Technology Integration Plans, press the user community for input on the execution of individual projects, and obtain user feedback on a regular basis.
- **Maximize the Use of Program-Sponsored Innovative Technologies.** In FY07, the PAA program will continue its emphasis on technology integration. Program personnel will continue to encourage project managers to consider technology integration early in the process (starting with needs collection) and build, into the project plan, tasks and associated resources that ensure that potential barriers to successful integration are properly evaluated and effectively addressed. The program will continue to expand user and acquisition manager involvement during program reviews. The objective is to support planning and preparation of the Program Objective Memorandum for authorized innovative alternatives to ensure they will be integrated into Fleet operations. In addition, the PAA program will capture post-integration lessons learned to validate proposed costs savings and other benefits associated with the integration of selected technologies.

FOR MORE INFORMATION

For more information about the operation of the PAA program, contact Scott Mauro, the PAA program manager, at 805-982-4454 (DSN: 551-4454), 202-685-9324 (DSN: 325-9324) or scott.mauro@navy.mil.

Members of the PAA program's TDWG can be contacted at the following phone numbers and email addresses:

WHO	COMMAND	PHONE	EMAIL
Mary Jo Bieberich	NAVSEA	301-227-4978	mary.bieberich@navy.mil
Bill Hertel	NAVSEA	301-227-5259	william.hertel@navy.mil
Jeff Heath	NAVFAC	805-982-1600	jeff.heath@navy.mil
Lynn Cahoon	NAVAIR	252-464-8141	albert.cahoon@navy.mil
Nick Paraskevas	NAVAIR	301-757-2140	nicholas.paraskevas@navy.mil
Cindy Webber	NAVAIR	760-939-2060	cynthia.webber@navy.mil
Stacey Curtis	SPAWAR	619-553-5255	stacey.curtis@navy.mil
Jerry Olen	SPAWAR	858-537-0255	jerry.olen@navy.mil

Document preparation assistance and graphic design services provided by Bruce McCaffrey Consulting, Inc. under General Services Administration contract number GS-10F-0375K.



